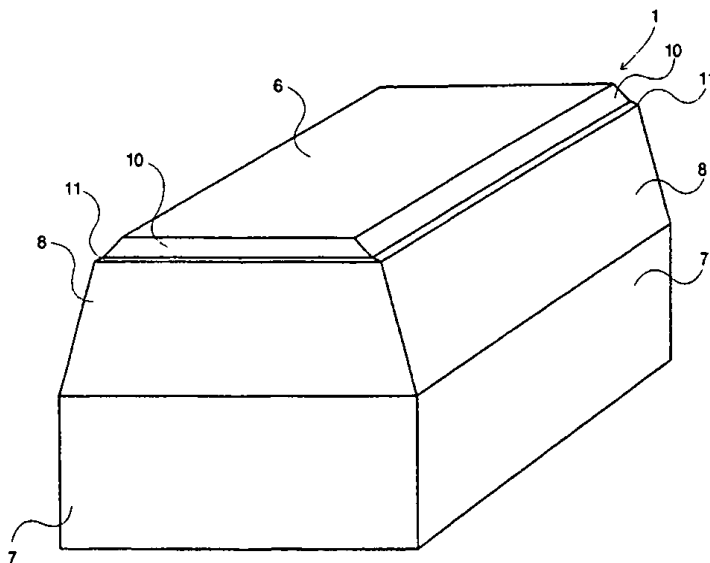


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>5</sup> : <b>E01C 5/00</b>		A1	(11) International Publication Number: <b>WO 99/64680</b>
			(43) International Publication Date: 16 December 1999 (16.12.99)
(21) International Application Number: PCT/GB99/01844		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).	
(22) International Filing Date: 10 June 1999 (10.06.99)			
(30) Priority Data: 9812462.1 11 June 1998 (11.06.98) GB 9817498.0 12 August 1998 (12.08.98) GB			
(71) Applicant (for all designated States except US): FORMPAVE LIMITED [GB/GB]; Tufthorn Avenue, Colesford, Gloucestershire GL16 8PR (GB).			
(72) Inventor; and (75) Inventor/Applicant (for US only): <u>HART</u> , Peter [GB/GB]; Formpave Limited, Tufthorn Avenue, Colesford, Gloucestershire GL16 8PR (GB).			
(74) Agent: BRYER, Kenneth, Robert; K. R. Bryer & Co., 7 Gay Street, Bath BA1 2PH (GB).		Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.	

(54) Title: PAVING BLOCK



## (57) Abstract

There is described a paving block (1) for use in the construction of a paved surface, which paving block has a top surface (6), a bottom surface (5) and at least one lateral surface (7) extending between the top (6) and bottom surfaces (5) and abutting in use at least part of a lateral surface of at least one adjacent paving block, wherein a portion of the lateral surface of the paving block adjacent to the top surface is tapered (8). There is also described a paving block in which at least one of the lateral surfaces (7) has a channel (15) extending substantially from the top (6) to the bottom surface (5) whereby to provide a drainage path for surface water or other liquid through the channel when the paving block is laid with other such paving blocks to form a paved surface. There is further described porous paving systems for flood, rainwater and liquid spillage management incorporating such paving blocks.

AL  
AM  
AT  
AU  
AZ  
BA  
BB  
BE  
BF  
BG  
BJ  
BR  
BY  
CA  
CF  
CG  
CH  
CI  
CM  
CN  
CU  
CZ  
DE  
DK  
EE

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents  
United States Patent and Trademark  
Office  
Box PCT  
Washington, D.C.20231  
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 09 March 2000 (09.03.00)	
International application No. PCT/GB99/01844	Applicant's or agent's file reference P1890-WO
International filing date (day/month/year) 10 June 1999 (10.06.99)	Priority date (day/month/year) 11 June 1998 (11.06.98)
Applicant HART, Peter	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

11 January 2000 (11.01.00)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Juan Cruz
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

## PCT

### NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Rule 71.1)

To:

BRYER, Kenneth Robert  
K. R. BRYER & CO.  
7 Gay Street  
BATH BA1 2PH  
GRANDE BRETAGNE

Date of mailing  
(day/month/year) 09.10.2000

Applicant's or agent's file reference  
P1890-WO

#### IMPORTANT NOTIFICATION

International application No.  
PCT/GB99/01844

International filing date (day/month/year)  
10/06/1999

Priority date (day/month/year)  
11/06/1998

Applicant  
FORMPAVE LIMITED et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

#### 4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/



European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized officer

Beuschel, H

Tel. +49 89 2399-2971



## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

15

Applicant's or agent's file reference P1890-WO	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB99/01844	International filing date (day/month/year) 10/06/1999	Priority date (day/month/year) 11/06/1998
International Patent Classification (IPC) or national classification and IPC E01C5/00		
Applicant FORMPAVE LIMITED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 8 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  11/01/2000	Date of completion of this report  09.10.2000
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer  Flores Hokkanen, P  Telephone No. +49 89 2399 2525 

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/01844

## I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

### Description, pages:

1-21 as originally filed

### Claims, No.:

1-16 with telefax of 05/07/2000

### Drawings, sheets:

1/7-7/7 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/01844

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Yes:	Claims	1-16
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-16
Industrial applicability (IA)	Yes:	Claims	1-16
	No:	Claims	

### 2. Citations and explanations

**see separate sheet**

## VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

**see separate sheet**

## **Section V**

1. Reference is made to the following documents:

D1: NL-A-6 711 788  
D2: DE 271 578 C  
D3: US-A-1 417 010  
D4: WO 96 12067 A  
D5: EP-A-0 504 536

2. Document D1 is regarded as being the closest prior art to the subject-matter of independent claim 1, and discloses (see page 2, paragraph 4 to page 3, paragraph 1 and Figure):

*A paving block 1 for use in the construction of a paved surface, which paving block 1 has an upper surface, a lower surface, and side and end lateral surfaces extending between the upper and lower surfaces and contacting in use at least part of a lateral surface of at least one adjacent paving block (in the figure, block 2 does not have contact with block 1, as they are placed leaving a gap, but being the lateral surfaces flat the blocks can be placed to make contact to each other), wherein a substantial portion the lateral surfaces of the paving block extending to the upper surface are tapered (the tapering is indicated by reference sign 3) along the entirety of the edge between the upper surface and the lateral surface.*

The subject-matter of independent claim 1 therefore differs from this known closest prior art D1 in that:

a) at least one of the lateral surfaces has a channel providing communication from the upper surface to the lower surface when the block is placed in abutting contact with another block in use thereof

The subject-matter of independent claim 1 is therefore novel (Article 33(2) PCT).

3. The problem to be solved by the present invention may therefore be regarded as providing a paving block with improved drainage characteristics.

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

---

International application No. PCT/GB99/01844

4. Feature a) which is to be considered the solution to the above cited problem against D1, cannot be considered as involving an inventive step (Article 33(3) PCT).

In D4 (page 2, paragraph 4 and Fig. 3) a permeable pavement is disclosed composed of pavings, where said pavings are provided with channels to allow drainage. It would therefore be obvious for the man skilled in the art to provide the blocks in D1 with channels to improve the drainage characteristics of the said blocks.

This opinion also considers the following:

- The tapering in the paving block of D1 cannot be just taken as a bevel, particularly due to its relative size, which extends to about 1/3 of the height of the paving block (see D1, figure).
  - The blocks disclosed in D4 are mentioned to have "grooves" (see Fig. 3 and page 2, line 22) to allow liquid to run through (page 2, lines 7-8). These "grooves" are provided at the sides of the paving block 1 in Fig. 3. There is therefore no apparent difference to a channel as mentioned in the application. The relative size of the said "grooves" in respect to upper surface of the paving block is even similar to that of the channels as in the application, for example as seen in the embodiment in Fig. 6.
5. Dependent claims 2 to 4 do not contain any features which meet the requirements of the PCT in respect of inventive step (Article 33(3) PCT):
- regarding claim 2, in D1 (see figure) the tapered portion of the block 1 extends for about 30% of the entire height of the lateral surface, which falls within 10% to 80% of the height.
  - regarding claim 3, in D2 (Figs. 4 and 6) paving blocks 1,2 are disclosed where the side corners f have a tapered portion c extending in acute angle in respect to the said side corners. Also in D3, Fig. 6 a paving block with tapered surfaces is disclosed, where the tapered portion 12 forms an acute angle relative to the



lateral surface 15. Therefore, providing a paving block with tapered portions with an angle of the tapered portion relative to the lateral surface between 0° and 15° is only an obvious choice of possibilities for the man skilled in the art.

- regarding claim 4, in D5, Fig. 5 a paving block is disclosed with one to two channels on its lateral surfaces.

- regarding claim 5, in D4, Fig. 3 the channel of the paving block is wider than deep.

- regarding claim 6, it only provides a size for the depth of the channel and cannot be regarded as inventive.

- regarding claim 7, in D5 (page 1, lines 1-3) a paving block made of concrete (which can be considered an impermeable material) is disclosed.

6. Document D4 is regarded as being the closest prior art to the subject-matter of independent claim 8, and discloses (see page 5, paragraph 3 to end of page 5 and Figs. 1 and 3):

*A paving surface for the management of rainwater, floodwater or liquid spillage having a permeable layer 1 on a supporting substrate layer 2, which supporting substrate layer is permeable to liquid and is of particulate material (in D4, a bed of gravel is disclosed) providing interstitial cavities for receiving rainwater, floodwater or spillage draining through the permeable layer, wherein the permeable layer 1 is constructed at least partially by the close-fitting without joint filling of a plurality of paving blocks (in D4, the paving blocks in Fig. 3 are laid).*

a) The subject-matter of independent claim 8 therefore differs from this known closest prior art D4 in that the blocks used for the paving surface are as claimed in claim 1 to 7.

The subject-matter of independent claim 8 is therefore novel (Article 33(2) PCT).

7. The problem to be solved by the present invention may therefore be regarded as

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

---

International application No. PCT/GB99/01844

providing paving blocks for a permeable surface not suffering from spalling due to the relative movement of the individual paving blocks.

8. However, the subject-matter of independent claim 8 cannot be considered as involving an inventive step.

In fact, claim 8 is directed to the use of the paving block as in claims 1 to 7 in a known permeable paving surface from D4 with corresponding blocks. This use, however, does not involve more than the intended employment of properties of the blocks as in claim 1 to 7. Hence, no inventive step is present in the subject-matter of independent claim 8.

9. Dependent claims 9 to 16 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, the reasons being as follows:

- regarding claims 9 and 10, providing the permeable surface entirely with tapered paving blocks or mixing tapered blocks with conventional blocks implies merely an obvious choice of possibilities for the skilled person.

- regarding claims 11 and 12, in D4 (page 5, paragraph 8-9 and Fig. 1) a filtering layer 3 is provided between the permeable layer 1 and the substrate layer 4. A dispersing layer 2 is additionally provided between the permeable layer 1 and the filtering layer 3.

- regarding claim 13, in D4 (page 6 and Fig. 1), the supporting substrate layer 4 is contained within the containment membrane 5.

- regarding claim 14, in D4 (page 6 and Fig. 2), a divider within the containment membrane 5 in form of a weir 9 is disclosed.

- regarding claim 15, in D4 (page 6 and Fig. 2), a drain valve and outlet pipe 11 connected to the containment membrane 5 are disclosed.

- regarding claim 16, in D4, page 2, paragraph 5, paving blocks made of different

materials which can be considered impermeable (such as cast iron) are disclosed.

## **Section VII**

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in documents D1 is not mentioned in the description, nor is this document identified therein.
2. Independent claims 1, 6, 12 and 16 are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (document D1 for claim 1 and D4 for claims 6, 12 and 16) being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).
3. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

## CLAIMS

1. A paving block for use in the construction of a paved surface, which paving block has a top surface, a  
5 bottom surface and at least one lateral surface extending between the top and bottom surfaces and abutting in use at least part of a lateral surface of at least one adjacent paving block, wherein a portion of the lateral surface of the paving block adjacent the top surface is  
10 tapered.

2. A paving block according to Claim 1, wherein the paving block has more than one lateral surface and each lateral surface is provided with a tapered portion.  
15

3. A paving block according to Claim 1 or 2, wherein the tapered portion of the paving block extends along the entirety of the edge between the top surface and the lateral surface.  
20

4. A paving block according to Claim 1, 2 or 3, wherein the portion of the lateral surface which is tapered extends over 10% to 80% of the entire height of the lateral surface.  
25

5. A paving system according to any preceding claim, wherein the angle at which the tapered portion extends with respect to the remaining portion of the lateral

surface is greater than  $0^{\circ}$  and less than  $15^{\circ}$ .

6. A paving block for use in the construction of a paved surface, which paving block has a top surface, a bottom surface and lateral surfaces extending between the top and bottom surfaces, in which at least one of the lateral surfaces has a channel extending substantially from the top to the bottom surface whereby to provide a drainage path for surface water or other liquid through the channel when the paving block is laid with other such paving blocks to form a paved surface.

7. A paving block as claimed in Claim 6, in which all lateral surfaces of the paving block have at least one channel therein.

8. A paving block as claimed in Claim 6 or Claim 7, in which the or each channel is wider than it is deep.

9. A paving block as claimed in any of Claims 6 to 8, in which the depth of the or each channel is not greater than about 5mm.

10. A paving block as claimed in any of Claims 6 to 9, in which the material from which the block is made is impermeable.

11. A paving block as claimed in any of Claims 6 to 10,

in which at least one lateral surface of the block has a tapered portion at or adjacent the region thereof where it joins the top surface of the paving block.

5 12. A paving system for the management of rainwater, floodwater or liquid spillage having a permeable layer on a supporting substrate layer, which supporting substrate layer is permeable to liquid and is of particulate material providing interstitial cavities for receiving  
10 rainwater, floodwater or spillage draining through the permeable layer, wherein the permeable layer is constructed at least partially by the close-fitting without joint filling of a plurality of paving blocks each of which has a top surface, a bottom surface and at  
15 least one lateral surface extending between the top and bottom surfaces and abutting in use at least part of a lateral surface of at least one adjacent paving block, wherein a portion of the lateral surface of the paving block adjacent to the top surface is tapered.

20

13. A paving system according to Claim 12, wherein the permeable layer is formed substantially entirely by tapered paving blocks.

25 14. A paving system according to Claims 12 to 13, wherein the permeable layer is formed from a mixture of tapered paving blocks and conventional paving blocks.

15. A paving system according to Claim 12,13 or 14, wherein some or all of the tapered paving blocks or any conventional blocks forming part of the permeable layer are formed of a porous material or are provided with  
5 drainage holes or channels.

16. A paving system for rainwater, flood or spillage management having a permeable layer on a supporting substrate layer, which supporting substrate layer is  
10 permeable to liquid and is of particulate material providing interstitial cavities for receiving rainwater, floodwater or spillage draining through the permeable layer, wherein the permeable layer is constructed at least partially by the close-fitting without joint  
15 filling of a plurality of paving blocks each of which has a top surface, a bottom surface and lateral surfaces extending between the top and bottom surfaces, in which at least one of the lateral surfaces has a channel extending substantially from the top to the bottom  
20 surface whereby to provide a drainage path for surface water or other liquid through the channel when the paving block is laid with other such paving blocks to form a paved surface.

25 17. A paving system as claimed in Claim 16, wherein the permeable layer is formed substantially entirely by paving blocks having at least one such channel.

18. A paving system according to any one of Claim 12 to 17, which is additionally provided with a filtering layer between the permeable layer and the substrate layer.

5 19. A paving system according to Claim 18, which is additionally provided with a dispersing layer between the permeable layer and the filtering layer.

20. A paving system according to any one of Claim 12 to 10 19, wherein the supporting substrate layer is contained within a containment membrane of impermeable material

22. A paving system according to Claim 20, which is provided with one or more dividing means for dividing 15 sections within the containment membrane.

22. A paving system according to Claim 20 or 21, wherein means are provided for the drainage of fluid contained within the containment membrane.

20

23. A paving system as claimed in any of Claims 12 to 22, in which the paving blocks are made from an impermeable material.

25 24. A paving system according to any one of Claims 12 to 23, wherein the permeable layer is formed substantially entirely by paving blocks according to any one of Claims 7 to 11 or a combination thereof.



CLAIMS

1. A paving block for use in the construction of a paved surface, which paving block has an upper surface,  
5 a lower surface and side and end lateral surfaces extending between the upper and lower surfaces and contacting in use at least part of a lateral surface of at least one adjacent paving block, wherein a substantial portion of at least two lateral surfaces of the paving  
10 block extending to the upper surface are tapered along the entirety of the edge between the upper surface and the lateral surface, and at least one of the lateral surfaces has a channel providing communication from the upper surface to the lower surface when the block is  
15 placed in abutting contact with another block in use thereof.

2. A paving block according to Claim 1, wherein the portion of a lateral surface which is tapered extends  
20 over 10% to 80% of the entire height of the lateral surface.

3. A paving block according to any preceding claim, wherein the angle at which the tapered portion extends  
25 with respect to the remaining portion of the lateral

26

surface is greater than  $0^{\circ}$  and less than  $15^{\circ}$ .

4. A paving block as claimed in any of Claims 1 to 3,  
in which all lateral surfaces of the paving block have at  
5 least one channel therein.

5. A paving block as claimed in any preceding Claim, in  
which the or each channel is wider than it is deep.

10 6. A paving block as claimed in any preceding Claim in  
which the depth of the or each channel is not greater  
than about 5mm.

7. A paving block as claimed in any preceding Claim in  
15 which the material from which the block is made is  
impermeable.

8. A paving surface for the management of rainwater,  
floodwater or liquid spillage having a permeable layer on  
20 a supporting substrate layer, which supporting substrate  
layer is permeable to liquid and is of particulate  
material providing interstitial cavities for receiving  
rainwater, floodwater or spillage draining through the  
permeable layer, wherein the permeable layer is  
25 constructed at least partially by the close-fitting

27

without joint filling of a plurality of paving blocks as claimed in any of Claims 1 to 7.

9. A paving surface according to Claim 8, wherein the permeable layer is formed substantially entirely by tapered paving blocks.

10. A paving surface according to Claims 8 or 9, wherein the permeable layer is formed from a mixture of tapered paving blocks and conventional paving blocks.

11. A paving surface according to any of Claims 8 to 10, which is additionally provided with a filtering layer between the permeable layer and the substrate layer.

15

12. A paving surface according to Claim 11, which is additionally provided with a dispersing layer between the permeable layer and the filtering layer.

20 13. A paving surface according to any of Claims 8 to 12, wherein the supporting substrate layer is contained within a containment membrane of impermeable material.

25 14. A paving surface according to Claim 13, which is provided with one or more dividing means for dividing

sections within the containment membrane.

15. A paving surface according to Claims 13 or 14,  
wherein means are provided for the drainage of fluid  
5 contained within the containment membrane.

16. A paving surface as claimed in any of Claims 8 to  
15, in which the paving blocks are made from an  
impermeable material.

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>P1890-W0</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/GB 99/ 01844</b>	International filing date (day/month/year) <b>10/06/1999</b>	(Earliest) Priority Date (day/month/year) <b>11/06/1998</b>
Applicant <b>FORMPAVE LIMITED et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.  
☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1  
☐ None of the figures.

## Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

Line 1, add "(1)" after "block" ,  
line 3, add "(6)" after "top surface" , and "(5)" after "bottom surface" ,  
line 4, add "(7)" after "surface", "(6)" after "top", and "(5)" after "surfaces"  
line 8, add "(8)" after "tapered" ,  
line 10, add "(7)" after "surfaces" , and "(15)" after "channel" ,  
line 11, add "(6)" after "top" , and "(5)" after "surface" .

## INTERNATIONAL SEARCH REPORT

International Application No

/GB 99/01844

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 E01C5/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 E01C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	NL 6 711 788 A (VAN NEERBOS) ✓ 4 March 1969 (1969-03-04)	1-4
Y	the whole document	5, 11, 12, 15.
Y	DE 271 578 C (SPAHRBIER) ✓ 12 March 1914 (1914-03-12)	5
A	the whole document	1-4
X	WO 96 12067 A (UNIV COVENTRY ; PRATT ✓ CHRISTOPHER JOHN (GB)) 25 April 1996 (1996-04-25)	6, 8, 10, 16-24
Y	cited in the application	11, 12, 15
A	the whole document	9
	--- -/-	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&amp;" document member of the same patent family

Date of the actual completion of the international search

27 September 1999

Date of mailing of the international search report

05/10/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Dijkstra, G

## INTERNATIONAL SEARCH REPORT

International Application No

/GB 99/01844

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 93 07339 A (EOLAS IRISH SCIENCE & TECH) ✓ 15 April 1993 (1993-04-15) figure 20 ---	1-3
X	US 1 417 010 A (WRIGHT) ✓ 23 May 1922 (1922-05-23) figures 4-6 ---	1,3-5
X	EP 0 504 536 A (SCHEIWILLER ROLF) ✓ 23 September 1992 (1992-09-23)	6,7,10, 16,17, 23,24
A	abstract; figures 5,6 -----	9



# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

/GB 99/01844

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
NL 6711788	A	04-03-1969	NONE		
DE 271578	C		NONE		
WO 9612067	A	25-04-1996	AT	171232 T	15-10-1998
			AU	3616995 A	06-05-1996
			CA	2200719 A	25-04-1996
			DE	69504859 D	22-10-1998
			DE	69504859 T	02-06-1999
			EP	0786034 A	30-07-1997
			ES	2124591 T	01-02-1999
			GB	2294077 A,B	17-04-1996
			JP	10511154 T	27-10-1998
WO 9307339	A	15-04-1993	AU	2765592 A	03-05-1993
			EP	0610269 A	17-08-1994
			GB	2276402 A,B	28-09-1994
			IE	74403 B	30-07-1997
US 1417010	A	23-05-1922	NONE		
EP 0504536	A	23-09-1992	AT	130646 T	15-12-1995
			DE	59106950 D	04-01-1996



Creation date: 03-10-2004  
Indexing Officer: LTOUCH - LY TOUCH  
Team: OIPEBackFileIndexing  
Dossier: 09719256

Legal Date: 12-17-2001

No.	Doccode	Number of pages
1	SRNT	2

Total number of pages: 2

Remarks:

Order of re-scan issued on .....